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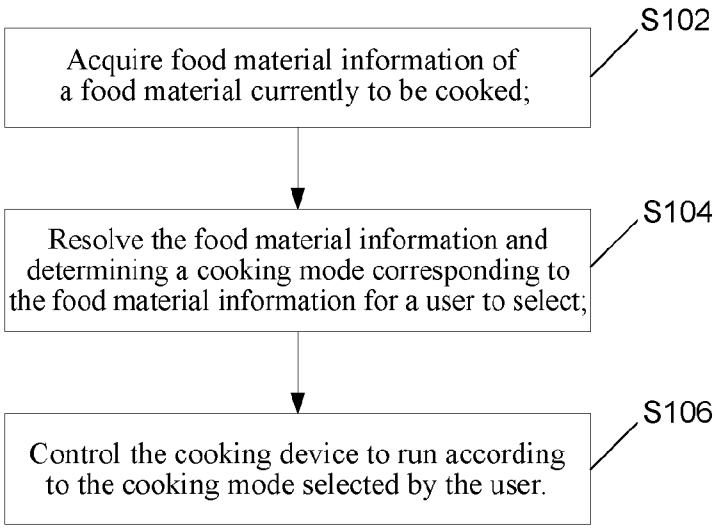

FIG. 1

(57) Abstract: The present invention discloses a cooking device, and a control method thereof and a control system thereof, including a cooking device storing at least one cooking mode, where steps of the control method include: acquiring food material information of a food material currently to be cooked (S102); resolving the food material information and determining a cooking mode corresponding to the food material information for a user to select (S104); and controlling the cooking device to run according to the cooking mode selected by the user (S106). A problem in the prior art that a user cannot cook according to attributes of food itself when using a cooking device is resolved according to the present invention; a cooking device can provide cooking modes corresponding to different food materials, so as to enable cooking safer and healthier and guarantee food taste as well.

COOKING DEVICE, AND CONTROL METHOD THEREOF AND CONTROL SYSTEM THEREOF

The present invention relates to the field of cooking control, and in particular, to a cooking device, and a control method thereof and a control system thereof.

Networking and intelligentization of household appliances have become a current research hotspot. Some technical solutions and products also appear on the market and can implement human-machine interaction between a user and household appliances by means of the wireless communication technology, but still have some deficiencies in the aspect of functions or operations.

For example, in application of a cooking device, a traditional cooking device itself cannot determine a kind, a volume, a quantity, an expiration date, and the like of food; a user basically relies on cooking experience to set cooking time and a temperature and probably insufficiently cooks or over cooks food. A function of automatically identifying food is added to an improved cooking device, and an apparatus, such as a sensor, needs to be added to detect food information, so that design difficulty and a cost are increased, and an application effect is not ideal.

No relatively effective solution is proposed currently specific to a problem in the prior art that a user cannot cook according to attributes of food itself when using a cooking device.

The present invention provides a cooking device, and a control method thereof, and a control system thereof, to at least resolve a problem in the prior art that a user cannot cook according to attributes of food itself when using a cooking device.

One aspect of the present invention provides a control method of a cooking device as follows.

The control method of the cooking device is applicable to the cooking device storing at least one cooking mode, where steps of the control method include: acquiring food material information of a food material currently to be cooked; resolving the food material information and determining a cooking mode corresponding to the food material infor-

mation for a user to select; and controlling the cooking device to run according to the cooking mode selected by the user. By means of the control method, the cooking device may provide, according to the food material information, a corresponding cooking mode for the user to select, and does not rely on empirical cooking of the user; in this way, insufficient cooking or over cooking of the food material is avoided, reasonable and scientific cooking of the food material is assured, and good taste of food is also asssured.

Preferably, after the user selects the cooking mode, the cooking device sets a control parameter in the selected cooking mode according to the food material information and then runs the cooking mode. After the cooking mode is determined, the cooking mode is provided with information for controlling the cooking device or a control parameter, such as a cooking temperature and cooking time, to control the cooking device to run.

Preferably, the food material information includes: at least one of a kind, a weight, a volume, an expiration date, or a temperature and time suitable for cooking of the food material. The foregoing food material information is an important factor influencing user cooking; the cooking device provides, by resolving the food material information, the corresponding cooking mode for the user to select.

Preferably, the acquiring food material information of a food material currently to be cooked includes: identifying, by the cooking device, an identification code including the food material information, where the identification code is arranged on a packaging bag of the food material. When the food material is manufactured, corresponding commodity information thereof is recorded on a packaging bag by using an identification code; the cooking device is configured with a corresponding identification or scanning apparatus, capable of identifying the identification code, so as to obtain the corresponding food material information.

Preferably, the identification code includes a two-dimension code, a bar code, or an NFC label, and the cooking device is provided with an identification apparatus for correspondingly identifying the two-dimension code, the bar code, or the NFC label.

Preferably, the resolving the food material information includes: determining whether the food material expires; when a determining result is yes, prompting the user that the food material expires; and when the determining result is no, providing a cooking mode available for the user to select according to other information of the food material. When resolving the food material, the cooking device acquires an expiration date of the food material and compares the expiration date with a current date to determine whether food expires. If the food expires, an alarm is given, and the user is prompted to pay attention.

Preferably, the cooking device includes a display screen, used to at least display the food material information and the cooking mode.

Preferably, the cooking device provides at least one cooking mode and displays the cooking mode on the display screen for the user to select.

Preferably, the cooking device and the mobile terminal establish a communication connection by means of the near field communication technology, and the acquiring food material information of a food material currently to be cooked includes: receiving, by the cooking device, the food material information, sent by the mobile terminal, of the food material currently to be cooked. The mobile terminal has relatively many food material information resources; by means of the NFC technology, the cooking device may directly acquire the food material information from the mobile terminal, which is more convenient and efficient.

Preferably, the mobile terminal acquires the food material information by identifying an identification code on a packaging bag of the food material. The mobile terminal is provided with an identification apparatus, used to identify a bar code, a two-dimension code, an NFC identification, and the like and reads the food material information by using a mobile terminal such as a cell phone and then sends the food material information to the cooking device; in this way, a cost for the identification apparatus to be installed within the cooking device may be lowered.

Preferably, when the cooking device does not store the cooking mode corresponding to the food material information, the cooking device acquires a cooking mode sent by the mobile terminal. Because food kinds are various, if the food kinds are stored in a memory

of the cooking device, it necessarily causes a capacity of the memory to increase and also causes a cost to correspondingly increase. Therefore, the cooking mode may be acquired from the mobile terminal.

Preferably, the mobile terminal and a remote server are in a communication connection, including: obtaining the cooking mode sent by the mobile terminal by using the remote server. The remote server is provided with a service center, capable of providing multiple cooking modes specific to different foods to the cooking device, for the user to select and refer to. The remote server sends the cooking mode to the mobile terminal according to a selection of the user.

The other aspect of the present invention provides a cooking device as follows.

The cooking device includes a control apparatus and stores at least one cooking mode, where the control apparatus includes: an acquisition module, used to acquire food material information of a food material currently to be cooked; a resolving module, used to resolve the food material information and determining a cooking mode corresponding to the food material information for a user to select; and a control module, used to control the cooking device to run according to the cooking mode selected by the user. By means of the cooking device, according to the food material information, the corresponding cooking mode may be provided for the user to select, and empirical cooking of the user is not relied on; in this way, insufficient cooking or over cooking of the food material is avoided, reasonable and scientific cooking of the food material is assured, and good taste of food is also assured.

Preferably, after the user selects the cooking mode, the cooking device sets a control parameter in the selected cooking mode according to the food material information and then runs the cooking mode. After the cooking mode is determined, the cooking mode is provided with information for controlling the cooking device or a control parameter, such as a cooking temperature and cooking time, to control the cooking device to run.

Preferably, the food material information includes: at least one of a kind, a weight, a volume, an expiration date, or a temperature and time suitable for cooking of the food material. The foregoing food material information is an important factor influencing user cooking; the cooking device provides, by resolving the food material information, the corresponding cooking mode for the user to select.

Preferably, the resolving module includes: a resolving unit, used to resolve the food material information; a determining unit, used to determine whether the food material expires, where when a determining result is yes, the user is prompted that the food material expires; and when the determining result is no, a cooking mode available for the user to select is provided according to other information of the food material. When resolving the food material, the cooking device acquires an expiration date of the food material and compares the expiration date with a current date to determine whether food expires. If the food expires, an alarm is given, and the user is prompted to pay attention.

Preferably, the acquisition module and a mobile terminal establish a communication connection by means of the near field communication technology, so as to receive the food material information, sent by the mobile terminal, of the food material currently to be cooked. The mobile terminal has relatively many food material information resources; by means of the NFC technology, the cooking device may directly acquire the food material information from the mobile terminal, which is more convenient and efficient.

Preferably, the mobile terminal acquires cooking information of the food material to be cooked by identifying an identification code on a packaging bag of the food material currently to be cooked. The mobile terminal is provided with an identification apparatus, used to identify a bar code, a two-dimension code, an NFC identification, and the like and reads the food material information by using a mobile terminal such as a cell phone and then sends the food material information to the cooking device; in this way, a cost for the identification apparatus to be installed within the cooking device may be lowered.

Preferably, when the cooking device does not store the corresponding cooking mode, the cooking device acquires a cooking mode sent by the mobile terminal. Because food kinds are various, if the food kinds are stored in a memory of the cooking device, it necessarily causes a capacity of the memory to increase and also causes a cost to correspondingly increase. Therefore, the cooking mode may be acquired from the mobile terminal.

Preferably, the mobile terminal and a remote server are in a communication connection, and the cooking mode sent by the mobile terminal is obtained by using the remote server. The remote server is provided with a service center, capable of providing multiple cooking modes specific to different foods to the cooking device, for the user to select and refer to. The remote server sends the cooking mode to the mobile terminal according to a selection of the user.

Preferably, the cooking device includes a display screen, used to at least display the food material information and the cooking mode.

Preferably, the cooking device provides at least one cooking mode and displays the cooking mode on the display screen for the user to select.

The present invention further provides a cooking system, including: a cooking device, storing at least one cooking mode; a mobile terminal, establishing a communication connection with the cooking device by means of the near field communication technology, where by the mobile terminal sends food material information of a food material currently to be cooked to the cooking device; and the cooking device acquires the food material information, resolves the food material information and determines a cooking mode corresponding to the food material information for a user to select, and controls the cooking device to run according to the cooking mode selected by the user.

By means of the control system, the mobile terminal directly sends the food material information to the cooking device, and the cooking device does not need to arrange, for example, an identification apparatus, to obtain the food material information. Besides, the cooking device provides the cooking mode corresponding to the food material for the user

to select, and does not rely on empirical cooking of the user; in this way, insufficient cooking or over cooking of the food material is avoided, reasonable and scientific cooking of the food material is assured, and good taste of food is also assured.

Preferably, the mobile terminal acquires cooking information of the food material to be cooked by identifying an identification code on a packaging bag of the food material currently to be cooked. The mobile terminal is provided with an identification apparatus, used to identify a bar code, a two-dimension code, an NFC identification, and the like and reads the food material information by using a mobile terminal such as a cell phone and then sends the food material information to the cooking device; in this way, a cost for the identification apparatus to be installed within the cooking device may be lowered.

Preferably, when the cooking device does not store the corresponding cooking mode, the cooking device acquires a cooking mode sent by the mobile terminal. Because food kinds are various, if the food kinds are stored in a memory of the cooking device, it necessarily causes a capacity of the memory to increase and also causes a cost to correspondingly increase. Therefore, the cooking mode may be acquired from the mobile terminal.

Preferably, the cooking system includes a remote server, establishing a communication connection with the mobile terminal, where the mobile terminal obtains the cooking mode by using the remote server. The remote server is provided with a service center, capable of providing multiple cooking modes specific to different foods to the cooking device, for the user to select and refer to. The remote server sends the cooking mode to the mobile terminal according to a selection of the user.

By means of the present invention, a problem in the prior art that a user cannot cook according to attributes of food itself when using a cooking device is resolved according to the present invention; a cooking device can provide cooking modes corresponding to different food materials, so as to enable cooking safer and healthier and guarantee food taste as well.

An accompanying drawing illustrated herein is provided for further understanding the present invention, and constitutes a part of the present application. Exemplary embodiments of the present invention and illustration thereof are used to explain the present invention and do not constitute improper limitation to the present invention. In the accompanying drawing:

FIG. 1 is a flowchart of a control method of household appliances of an embodiment according to the present invention;

FIG. 2 is a schematic diagram (I) of a control method of household appliances of an embodiment according to the present invention;

FIG. 3 is a preferred flowchart of a control method of household appliances of an embodiment according to the present invention;

FIG. 4 is a schematic diagram (II) of a control method of household appliances of an embodiment according to the present invention;

FIG. 5 is a schematic diagram (III) of a control method of household appliances of an embodiment according to the present invention;

FIG. 6 is a module schematic diagram of a control apparatus of a cooking device of an embodiment according to the present invention; and

FIG. 7 is a preferred module schematic diagram of a control apparatus of a cooking device of an embodiment according to the present invention.

The present invention is illustrated in detail with reference to the Figures of the accompanying drawing and embodiments in the below. It should be noted that in the case of absence of conflict, embodiments and features in embodiments in the present application can be mutually combined.

Embodiments of the present invention provide a control method of a cooking device.

The control method of the cooking device is applied to a cooking device storing at least one cooking mode.

The cooking device may be a cooking device for daily family use, such as a baking oven, a steam box, a microwave oven, and an electric cooker, is provided with a memory, and may store multiple cooking modes, used to cook food materials of different kinds. The cooking mode may be written in multiple program languages and form corresponding control information.

FIG. 1 is a flowchart of a control method of a cooking device of an embodiment according to the present invention. As shown in FIG. 1, steps of the control method include:
Step S102: Acquire food material information of a food material currently to be cooked.

The cooking device is provided with an identification apparatus such as a scanning apparatus and a sensing apparatus, used to acquire the food material information, such as a kind, a weight, and a volume.

Step S104: Resolve the food material information and determine a cooking mode corresponding to the food material information for a user to select.

The cooking device determines, by resolving the food material information, according to the stored cooking mode, the cooking mode corresponding to the food material for the user to select. For example, when a microwave oven device cooks fish, multiple modes such as steaming and boiling may be used for the user to select.

Step S106: Control the cooking device to run according to the cooking mode selected by the user.

The cooking mode is provided with a control parameter, used to control the cooking device to run.

By means of the control method, the cooking device may provide, according to the food material information, a corresponding cooking mode for the user to select, and does not rely on empirical cooking of the user; in this way, insufficient cooking or over cooking of the food material is not caused, reasonable and scientific cooking of the food material is guaranteed, and good taste of food is also guaranteed.

Preferably, after the user selects the cooking mode, the cooking device sets a control parameter in the selected cooking mode according to the food material information and then runs the cooking mode.

After the cooking mode is determined, the cooking mode is provided with information for controlling the cooking device or a control parameter, such as a cooking temperature and cooking time, to control the cooking device to run.

Preferably, the food material information includes: at least one of a kind, a weight, a volume, an expiration date, or a temperature and time suitable for cooking of the food material.

The foregoing food material information is an important factor influencing user cooking; the cooking device provides, by resolving the food material information, the corresponding cooking mode for the user to select. For example, when an electric cooker device acquires that the food material information is northern rice, a rice cooking mode or a congee cooking mode may be selected; when rice needs to be cooked, a water supply volume for cooking northern rice is more than that for cooking southern rice according characteristics of northern rice.

Preferably, FIG. 2 is a schematic diagram (I) of a control method of household appliances of an embodiment according to the present invention. As shown in FIG. 2, the acquiring food material information of a food material currently to be cooked includes: identifying, by the cooking device, an identification code including the food material information, where the identification code is arranged on a packaging bag of the food material.

When the food material is manufactured, corresponding commodity information thereof is recorded on a packaging bag. Because of development of an identification code in the prior art, the foregoing information can exist in the identification code. The cooking device is configured with a corresponding identification or scanning apparatus, capable of identifying the identification code, so as to obtain the corresponding food material information.

Preferably, as shown in FIG. 2, the identification code includes a two-dimension code, a bar code, or an NFC label, and the cooking device is provided with an identification apparatus for correspondingly identifying the two-dimension code, the bar code, or the NFC label.

The identification information may be a two-dimension code and a bar code, and a code scanning apparatus of the cooking device identifies the identification information and reads corresponding household appliance information. The identification information may also be an NFC module, connected to the cooking device by means of the NFC technology, and the cooking device may read the food material information in the module.

In a preferred solution, FIG. 3 is a preferred flowchart of a control method of household appliances of an embodiment according to the present invention. As shown in FIG. 3, in the steps of the control method, the resolving the food material information includes:

Step S103: Resolve the food material information and determine whether the food material expires;

when a determining result is yes, prompt the user that the food material expires; and

when the determining result is no, go to step S104 and provide a cooking mode available for the user to select according to other information of the food material.

When resolving the food material, the cooking device acquires an expiration date of the food material and compares the expiration date with a current date to determine whether food expires. If the food expires, an alarm is given, and the user is prompted to pay attention.

Preferably, the cooking device includes a display screen, used to at least display the food material information and the cooking mode.

After acquiring the current food material information, the cooking device displays the food material information on the display screen of the cooking device. Besides, the cooking mode is provided according to the food material information for the user to select.

Preferably, the cooking device provides at least one cooking mode and displays the cooking mode on the display screen for the user to select.

Preferably, FIG. 4 is a schematic diagram (II) of a control method of household appliances of an embodiment according to the present invention. As shown in FIG. 4, the cooking device and the mobile terminal establish a communication connection by means of the near field communication technology (Near Field Communication, NFC), and the acquiring food material information of a food material currently to be cooked includes: receiving, by the cooking device, the food material information, sent by the mobile terminal, of the food material currently to be cooked.

The mobile terminal and the cooking device are enabled to have an NFC communication function by adding an NFC communication module thereon, and mutual reading and writing or data exchange between the mobile terminal and the cooking device are implemented by approaching an NFC antenna area by the mobile terminal with an NFC function. The mobile terminal may be a cell phone, a tablet computer, and the like, which is not limited herein.

The mobile terminal has relatively many food material information resources; by means of the NFC technology, the cooking device may directly acquire the food material information from the mobile terminal, which is more convenient and efficient.

Preferably, FIG. 5 is a schematic diagram (III) of a control method of household appliances of an embodiment according to the present invention. As shown in FIG. 5, the mobile terminal acquires the food material information by identifying an identification code on a packaging bag of the food material and sends the food material information to the cooking device.

The mobile terminal is provided with an identification apparatus, used to identify a bar code, a two-dimension code, and an NFC identification. Currently, the identification apparatus has basically become a cell phone standard configuration, reads, by using a mobile terminal such as a cell phone, the food material information and then sends the food material information to the cooking device. Adding the identification or scanning apparatus in the cooking device increases a cost of the cooking device. Besides, the food material information is displayed on a cell phone, and a display screen does not need to be added on the cooking device.

Preferably, when the cooking device does not store the cooking mode corresponding to the food material information, the cooking device acquires a cooking mode sent by the mobile terminal.

The cooking device is provided with a memory, storing cooking modes therein. However, because food kinds are various, if the food kinds are stored in the memory, it necessarily causes a capacity of the memory to increase and also causes a cost to correspondingly increase. Therefore, the cooking mode may be acquired from the mobile terminal. The cooking mode is directly set in the mobile terminal, that is, the user sets a control parameter or instruction of the cooking mode in the mobile terminal.

Preferably, as shown in FIG. 5, the mobile terminal and a remote server are in a communication connection, including: obtaining the cooking mode sent by the mobile terminal by using the remote server.

When no another corresponding cooking mode exists in the mobile terminal, and when the user does not set a control parameter on his own, the mobile terminal obtains the cooking mode from the remote server. The remote server is provided with a service center, capable of providing multiple cooking modes specific to different foods to the cooking device, for the user to select and refer to. The remote server sends the cooking mode to the mobile terminal according to a selection of the user.

An embodiment of the present invention further provides a cooking device, corresponding to the embodiment of the control method.

The cooking device includes a control apparatus and stores at least one cooking mode. The cooking device may be a cooking device for daily family use, such as a baking oven, a steam box, a microwave oven, and an electric cooker, is provided with a memory, and stores multiple cooking modes, used to cook food materials of different kinds. The cooking mode may be written in multiple program languages and form corresponding control information. The memory may be arranged in the control apparatus or may be independent from the control apparatus.

FIG. 6 is a module schematic diagram of a control apparatus of a cooking device of an embodiment according to the present invention. As shown in FIG. 6, the control apparatus includes:

an acquisition module 22, used to acquire food material information of a food material currently to be cooked,

where the cooking device is provided with an identification apparatus such as a scanning apparatus and a sensing apparatus, used to acquire the food material information, such as a kind, a weight, and a volume; and the identification apparatus may be arranged in the control apparatus or may be independent from the control apparatus;

a resolving module 24, connected to the acquisition module 22 and used to resolve the food material information and determining a cooking mode corresponding to the food material information for a user to select,

where the control apparatus determines, according to the stored cooking mode and by resolving the food material information, the cooking mode corresponding to the food material for the user to select. For example, when a microwave oven device cooks fish, multiple modes such as steaming and boiling may be used for the user to select; and

a control module 26, connected to the resolving module 24 ad used to control the cooking device to run according to the cooking mode selected by the user,

where the cooking mode is provided with a control parameter, used to control the cooking device to run.

By means of the cooking device, according to the food material information, a corresponding cooking mode may be provided for the user to select, and empirical cooking of the user is not relied on; in this way, insufficient cooking or over cooking of the food material is not caused, reasonable and scientific cooking of the food material is guaranteed, and good taste of food is also guaranteed.

Preferably, after the user selects the cooking mode, the cooking device sets a control parameter in the selected cooking mode according to the food material information and then runs the cooking mode.

After the cooking mode is determined, the cooking mode is provided with information for controlling the cooking device or a control parameter, such as a cooking temperature and cooking time, and the controller controls the cooking device to run according to the parameter.

Preferably, the food material information includes: at least one of a kind, a weight, a volume, an expiration date, or a temperature and time suitable for cooking of the food material.

The foregoing food material information is an important factor influencing user cooking; the cooking device provides, by resolving the food material information, the corresponding cooking mode for the user to select. For example, when an electric cooker device acquires that the food material information is northern rice, a rice cooking mode or a congee cooking mode may be selected; when rice needs to be cooked, a water supply volume for cooking northern rice is more than that for cooking southern rice according characteristics of northern rice.

Preferably, FIG. 7 is a module schematic diagram of a control apparatus of a cooking device of an embodiment according to the present invention.

As shown in FIG. 7, the resolving module 24 includes:
a resolving unit 241, used to resolve the food material information; and
a determining unit 242, used to determine whether the food material expires,
where when a determining result is yes, the user is prompted that the food material expires; and when the determining result is no, a cooking mode available for the user to select is provided according to other information of the food material.

When the food material is resolved, an expiration date of the food material is acquired and is compared with a current date to determine whether food expires. If the food expires, an alarm is given, and the user is prompted to pay attention.

Preferably, the acquisition module 22 and a mobile terminal establish a communication connection by means of the near field communication technology (Near Field Communication, NFC), so as to receive the food material information, sent by the mobile terminal, of the food material currently to be cooked.

The mobile terminal and the cooking device (a controller) are enabled to have an NFC communication function by adding an NFC communication module thereon, and mutual reading and writing or data exchange between the mobile terminal and the cooking device are implemented by approaching an NFC antenna area by the mobile terminal with an NFC function. The mobile terminal may be a cell phone, a tablet computer, and the like, which is not limited herein.

The mobile terminal has relatively many food material information resources; by means of the NFC technology, the cooking device may directly acquire the food material information from the mobile terminal, which is more convenient and efficient.

Preferably, the mobile terminal acquires the food material information by identifying an identification code on a packaging bag of the food material and sends the food material information to the acquisition module 22.

The mobile terminal is provided with an identification apparatus, used to identify a bar code, a two-dimension code, and an NFC identification. Currently, the identification apparatus has basically become a cell phone standard configuration, reads, by using a mobile terminal such as a cell phone, the food material information and then sends the food material information to the cooking device. Adding the identification or scanning apparatus in the cooking device increases a cost of the cooking device. Besides, the food material information is displayed on a cell phone, and a display screen does not need to be added on the cooking device.

Preferably, when the cooking device does not store the corresponding cooking mode, the cooking device acquires a cooking mode sent by the mobile terminal.

The cooking device is provided with a memory, storing cooking modes therein. However, because food kinds are various, if the food kinds are stored in the memory, it necessarily causes a capacity of the memory to increase and also causes a cost to correspondingly increase. Therefore, the cooking mode may be acquired from the mobile terminal. The cooking mode may be directly set in the mobile terminal, that is, the user sets a control parameter or instruction of the cooking mode in the mobile terminal.

Preferably, the mobile terminal and a remote server are in a communication connection, including: obtaining the cooking mode sent by the mobile terminal by using the remote server.

When no another corresponding cooking mode exists in the mobile terminal, and when the user does not set a control parameter on his own, the mobile terminal obtains the cooking mode from the remote server. The remote server is provided with a service center, capable of providing multiple cooking modes specific to different foods to the cooking device, for the user to select and refer to. The remote server sends the cooking mode to the mobile terminal according to a selection of the user.

Preferably, the cooking device includes a display screen, used to at least display the food material information and the cooking mode.

After acquiring the current food material information, the cooking device displays the food material information on the display screen of the cooking device. Besides, the cooking mode is provided according to the food material information for the user to select.

Preferably, the cooking device provides at least one cooking mode and displays the cooking mode on the display screen for the user to select.

An embodiment of the present invention further provides a control system of a cooking device, corresponding to the control method in the foregoing embodiment. As shown in FIG. 5, the control system includes:

a cooking device, storing at least one cooking mode, where the cooking device may be a cooking device for daily family use, such as a baking oven, a steam box, a microwave oven, and an electric cooker, is provided with a memory, and stores multiple cooking

modes, used to cook food materials of different kinds; and the cooking mode may be written in multiple program languages and form corresponding control information; and

a mobile terminal, establishing a communication connection with the cooking device by means of the near field communication technology (Near Field Communication, NFC), where the mobile terminal and the cooking device (a controller) are enabled to have an NFC communication function by adding an NFC communication module thereon, and mutual reading and writing or data exchange between the mobile terminal and the cooking device are implemented by approaching an NFC antenna area by the mobile terminal with an NFC function. The mobile terminal may be a cell phone, a tablet computer, and the like, which is not limited herein. The mobile terminal has relatively many food material information resources; by means of the NFC technology, the cooking device may directly acquire the food material information from the mobile terminal, which is more convenient and efficient.

The mobile terminal sends food material information of a food material currently to be cooked to the cooking device; and the cooking device acquires the food material information, resolves the food material information and determines a cooking mode corresponding to the food material information for a user to select, and controls the cooking device to run according to the cooking mode selected by the user. The cooking mode is provided with information for controlling the cooking device or a control parameter, such as a cooking temperature and cooking time, to control the cooking device to run.

By means of the control system, the mobile terminal directly sends the food material information to the cooking device, and the cooking device does not need to arrange, for example, an identification apparatus, to obtain the food material information. Besides, the cooking device provides the cooking mode corresponding to the food material for the user to select, and does not rely on empirical cooking of the user; in this way, insufficient cooking or over cooking of the food material is not caused, reasonable and scientific cooking of the food material is guaranteed, and good taste of food is also guaranteed.

Preferably, the mobile terminal acquires the food material information by identifying an identification code on a packaging bag of the current food material.

The mobile terminal is provided with an identification apparatus, used to identify a bar code, a two-dimension code, and an NFC identification. Currently, the identification apparatus has basically become a cell phone standard configuration, reads, by using a mobile terminal such as a cell phone, the food material information and then sends the food material information to the cooking device. Adding the identification or scanning apparatus in the cooking device increases a cost of the cooking device. Besides, the food material information is displayed on a cell phone, and a display screen does not need to be added on the cooking device.

Preferably, when the cooking device does not store the corresponding cooking mode, the cooking device acquires a cooking mode sent by the mobile terminal.

The cooking device is provided with a memory, storing cooking modes therein. However, because food kinds are various, if the food kinds are stored in the memory, it necessarily causes a capacity of the memory to increase and also causes a cost to correspondingly increase. Therefore, the cooking mode may be acquired from the mobile terminal. The cooking mode is directly set in the mobile terminal, that is, the user sets a control parameter or instruction of the cooking mode in the mobile terminal.

Preferably, the cooking system includes a remote server, establishing a communication connection with the mobile terminal, where the mobile terminal obtains the cooking mode by using the remote server.

When no another corresponding cooking mode exists in the mobile terminal, and when the user does not set a control parameter on his own, the mobile terminal obtains the cooking mode from the remote server. The remote server is provided with a service center, capable of providing multiple cooking modes specific to different foods to the cooking device, for the user to select and refer to. The remote server sends the cooking mode to the mobile terminal according to a selection of the user.

By means of the present invention, a problem in the prior art that a user cannot cook according to attributes of food itself when using a cooking device is resolved according to the present invention; a cooking device can provide cooking modes corresponding to different food materials, so as to enable cooking safer and healthier and guarantee food taste as well.

Various specific embodiments described in the foregoing and shown in accompanying drawings are only used for illustrating the present invention, and are not regarded as the entirety of the present invention. Within the scope of the basic technical thought of the present invention, any types of modifications for the present invention made by persons ordinarily skilled in the art fall within the scope of the present invention.

CLAIMS

1. A control method of a cooking device, applicable to the cooking device storing at least one cooking mode, wherein steps of the control method comprise:
acquiring food material information of a food material currently to be cooked;
resolving the food material information and determining a cooking mode corresponding to the food material information for a user to select; and
controlling the cooking device to run according to the cooking mode selected by the user.

2. The control method according to claim 1, wherein:
after the user selects the cooking mode, the cooking device sets a control parameter in the selected cooking mode according to the food material information and then runs the cooking mode.

3. The control method according to claim 1, wherein the food material information comprises:
at least one of a kind, a weight, a volume, an expiration date, or a temperature and time suitable for cooking of the food material.

4. The control method according to claim 1, wherein the acquiring food material information of a food material currently to be cooked comprises:
identifying, by the cooking device, an identification code comprising the food material information, wherein the identification code is arranged on a packaging bag of the food material.

5. The control method according to claim 4, wherein:
the identification code comprises a two-dimension code, a bar code, or an NFC label, and the cooking device is provided with an identification apparatus for correspondingly identifying the two-dimension code, the bar code, or the NFC label.

6. The control method according to claim 1, wherein the resolving the food material information comprises:
determining whether the food material expires;
when a determining result is yes, prompting the user that the food material expires; and
when the determining result is no, providing a cooking mode available for the user to select according to other information of the food material.

7. The control method according to claim 1, wherein:
the cooking device comprises a display screen, used to at least display the food material information and the cooking mode.

8. The control method according to claim 7, wherein:
the cooking device provides at least one cooking mode and displays the cooking mode on the display screen for the user to select.

9. The control method according to claim 1, wherein the cooking device and the mobile terminal establish a communication connection by means of the near field communication technology, and the acquiring food material information of a food material currently to be cooked comprises:
receiving, by the cooking device, the food material information, sent by the mobile terminal, of the food material currently to be cooked.

10. The control method according to claim 9, wherein:
the mobile terminal acquires the food material information by identifying an identification code on a packaging bag of the food material and sends the food material information to the cooking device.

11. The control method according to claim 9 or 10, wherein:
when the cooking device does not store the cooking mode corresponding to the food material information, the cooking device acquires a cooking mode sent by the mobile terminal.

12. The control method according to claim 11, wherein the mobile terminal and a remote server are in a communication connection, comprising:
obtaining the cooking mode sent by the mobile terminal by using the remote server.

13. A cooking device comprises a control apparatus and stores at least one cooking mode, wherein the control apparatus comprises:
an acquisition module, used to acquire food material information of a food material currently to be cooked;
a resolving module, used to resolve the food material information and determining a cooking mode corresponding to the food material information for a user to select; and
a control module, used to control the cooking device to run according to the cooking mode selected by the user.

14. The cooking device according to claim 13, wherein:
after the user selects the cooking mode, the cooking device sets a control parameter in the selected cooking mode according to the food material information and then runs the cooking mode.

15. The cooking device according to claim 13, wherein the food material information comprises:
at least one of a kind, a weight, a volume, an expiration date, or a temperature and time suitable for cooking of the food material.

16. The cooking device according to claim 13, wherein the resolving module comprises:
a resolving unit, used to resolve the food material information; and
a determining unit, used to determine whether the food material expires, wherein
when a determining result is yes, the user is prompted that the food material expires; and
when the determining result is no, a cooking mode available for the user to select is provided according to other information of the food material.

17. The cooking device according to claim 13, wherein:
the acquisition module and a mobile terminal establish a communication connection by means of the near field communication technology, so as to receive the food material information, sent by the mobile terminal, of the food material currently to be cooked.

18. The cooking device according to claim 17, wherein:
the mobile terminal acquires the food material information by identifying an identification code on a packaging bag of the food material and sends the food material information to the acquisition module.

19. The cooking device according to claim 17 or 18, wherein:
when the cooking device does not store the corresponding cooking mode, the cooking device acquires a cooking mode sent by the mobile terminal.

20. The cooking device according to claim 19, wherein:
the mobile terminal and a remote server are in a communication connection, and the cooking mode sent by the mobile terminal is obtained by using the remote server.

21. The cooking device according to claim 13, comprising:
a display screen, used to at least display the food material information and the cooking mode.

22. The cooking device according to claim 21, wherein:
the cooking device provides at least one cooking mode and displays the cooking mode on the display screen for the user to select.

23. A cooking system, comprising:
a cooking device, storing at least one cooking mode; and
a mobile terminal, establishing a communication connection with the cooking device by means of the near field communication technology, wherein
the mobile terminal sends food material information of a food material currently to be cooked to the cooking device; and
the cooking device acquires the food material information, resolves the food material

information and determines a cooking mode corresponding to the food material information for a user to select; and controls the cooking device to run according to the cooking mode selected by the user.

24. The cooking system according to claim 23, wherein:
the mobile terminal acquires the food material information by identifying an identification code on a packaging bag of the current food material.

25. The cooking system according to claim 23, wherein:
when the cooking device does not store the corresponding cooking mode, the cooking device acquires a cooking mode sent by the mobile terminal.

26. The cooking system according to claim 23, comprising:
a remote server, establishing a communication connection with the mobile terminal, wherein
the mobile terminal obtains the cooking mode by using the remote server.

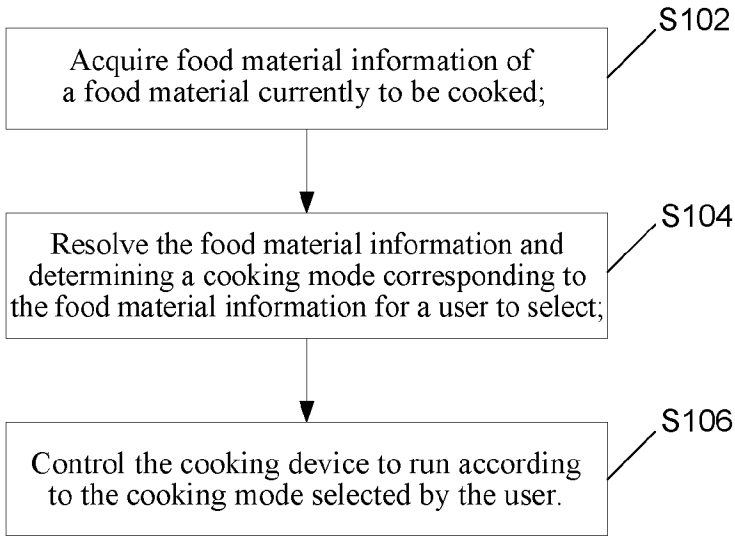
Acquire food material information of a food material currently to be cooked;
S102
Resolve the food material information and determining a cooking mode corresponding to the food material information for a user to select;
S104
Control the cooking device to run according to the cooking mode selected by the user.
S106

FIG. 1

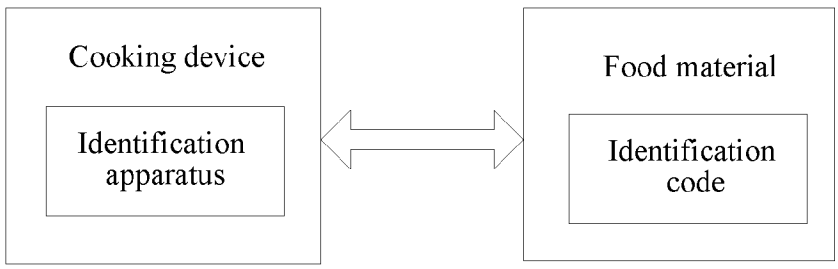
Cooking device
Identification apparatus
Food material
Identification code

FIG. 2

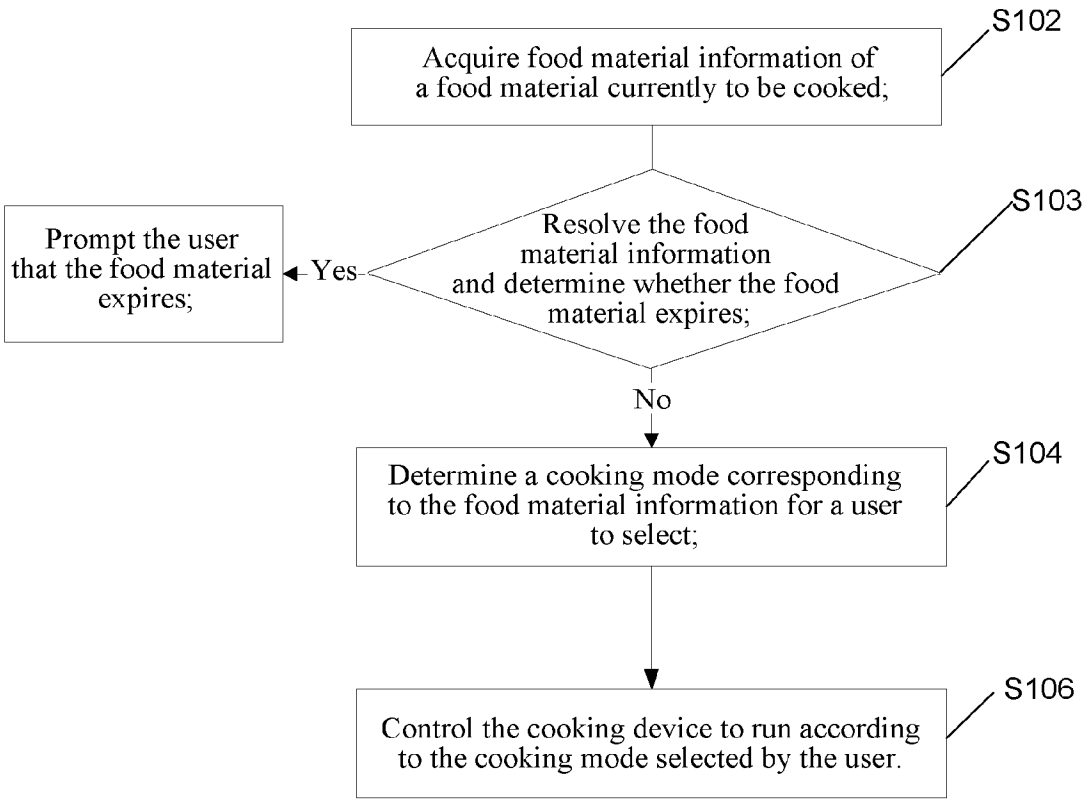
Acquire food material information of a food material currently to be cooked;
S102
Resolve the food material information and determine whether the food material expires;
S103
Yes
Prompt the user that the food material expires;
No
Determine a cooking mode corresponding to the food material information for a user to select;
S104
Control the cooking device to run according to the cooking mode selected by the user.
S106

FIG. 3

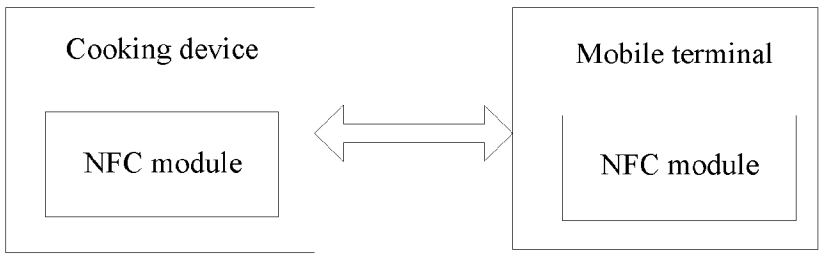
Cooking device
NFC module
Mobile terminal
NFC module

FIG. 4

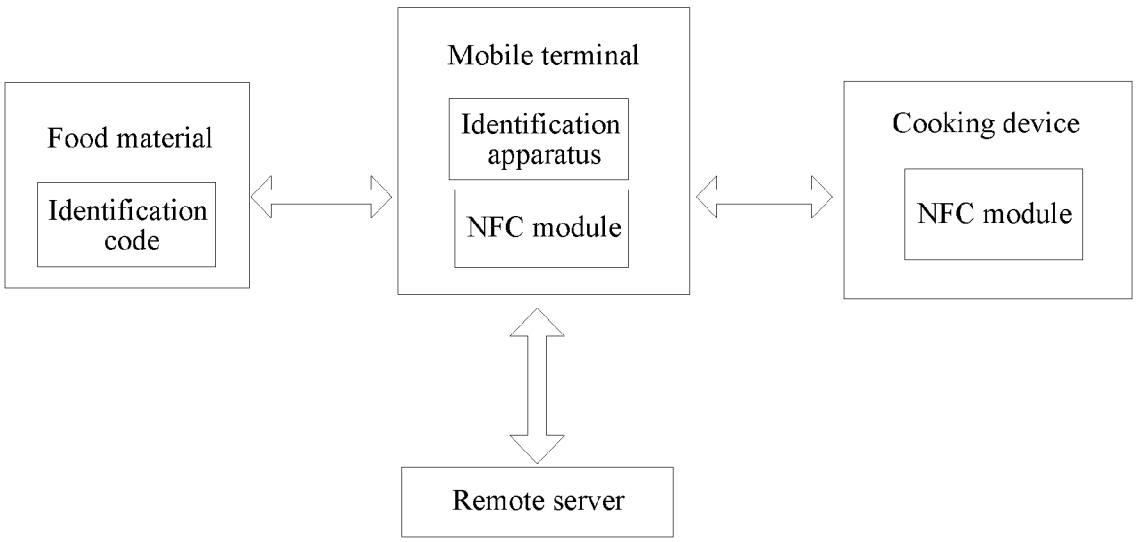
Mobile terminal
Identification apparatus
NFC module
Food material
Identification code
Cooking device
NFC module
Remote server

FIG. 5

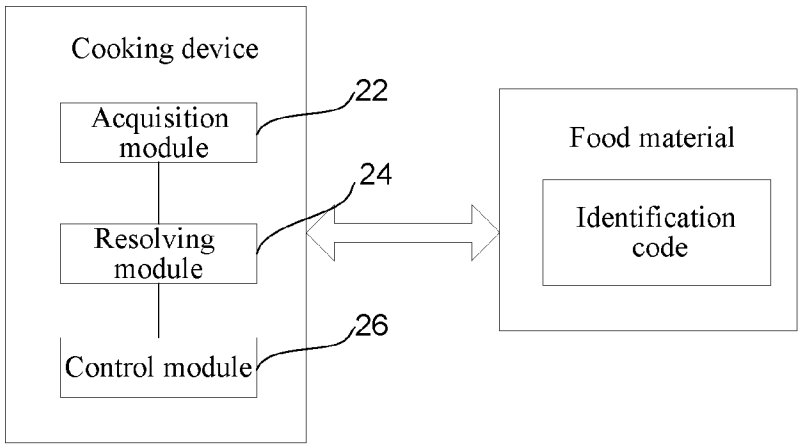
Cooking device
Acquisition module
22
Resolving module
24
Control module
26
Food material
Identification code

FIG. 6

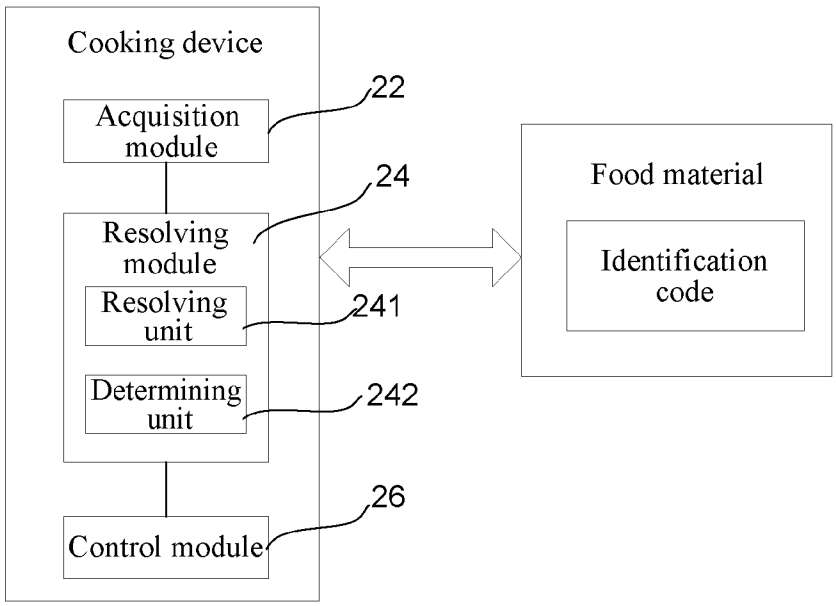
Cooking device
Acquisition module
22
Resolving module
24
Resolving unit
241
Determining unit
242
Control module
26
Food material
Identification code

FIG. 7

INTERNATIONAL SEARCH REPORT

International application No
PCT/EP2016/061219

A. CLASSIFICATION OF SUBJECT MATTER
INV. F24C7/08
ADD.

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
A21B F24C

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
EPO-Internal, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X Y	US 2003/139843 A1 (HU ZIQIANG [US] ET AL) 24 July 2003 (2003-07-24) paragraphs [0014], [0015], [0019], [0022]; figure 3	1-5, 13-15 6,16
Y	EP 1 382 256 A1 (SAMSUNG ELECTRONICS CO LTD [KR]) 21 January 2004 (2004-01-21) claim 1; figure 6	6,16
A	US 2014/263640 A1 (HEIT RYDER C [US] ET AL) 18 September 2014 (2014-09-18) the whole document	1-6, 13-16
A	WO 2009/157842 A1 (ELECTROLUX AB [SE]; PINKERT MATTHIAS [DE]) 30 December 2009 (2009-12-30) the whole document	1-6, 13-16

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[X] Further documents are listed in the continuation of Box C.

[X] See patent family annex.

* Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier application or patent but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
30 September 2016	13/10/2016

Name and mailing address of the ISA/	Authorized officer
European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Fax: (+31-70) 340-3016	Adant, Vincent

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Form PCT/ISA/210 (second sheet) (April 2005)

INTERNATIONAL SEARCH REPORT

International application No
PCT/EP2016/061219

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	DE 10 2005 040206 A1 (EGO ELEKTRO GERAETEBAU GMBH [DE]) 22 February 2007 (2007-02-22) claims 1,3,8,10 -----	1,7-12, 17-26

INTERNATIONAL SEARCH REPORT

International application No.
PCT/EP2016/061219

Box No. II Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)

This international search report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:

2. ☐ Claims Nos.:
because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:

3. ☐ Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box No. III Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

see additional sheet

1. ☒ As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims.

2. ☐ As all searchable claims could be searched without effort justifying an additional fees, this Authority did not invite payment of additional fees.

3. ☐ As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:

4. ☐ No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest

☐ The additional search fees were accompanied by the applicant's protest and, where applicable, the payment of a protest fee.

☐ The additional search fees were accompanied by the applicant's protest but the applicable protest fee was not paid within the time limit specified in the invitation.

☒ No protest accompanied the payment of additional search fees.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. claims: 1-6, 13-16

   Control method comprising a step of acquiring food material information, and device adapted for this method

   ---

2. claims: 7, 8, 21, 22

   Control method wherein a display is used for displaying food material information, and device comprising such a display

   ---

3. claims: 9-12, 17-20, 23-26

   Control method, wherein a mobile terminal is used to acquire food information, and cooking device adapted for said method

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INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No
PCT/EP2016/061219

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
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WO 2009157842 A1	30-12-2009	AU 2009263058 A1	30-12-2009
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		EP 2318768 A1	11-05-2011
		US 2011163084 A1	07-07-2011
		WO 2009157842 A1	30-12-2009
DE 102005040206 A1	22-02-2007	NONE	